

1. (Currently Amended) A bone cement plug for fitting into the intramedullary canal within a bone to restrict flow of bone cement during surgery, comprising which comprises:

a. a sleeve having a longitudinal axis, whose wall is circumferentially continuous and has an outer surface configured to contact for contacting the wall of the canal, and whose inner surfaces configured to define an internal cavity whose diameter decreases from a distal end to a proximal end, whereat the internal cavity communicates with an opening formed in the outer surface and the longitudinal axis of the sleeve, the sleeve being formed from a deformable material and configured to so that it can be expanded transversely to contact the surface of the canal;;

b. an expander comprising a shaft having a distal end and a transverse portion that extends radially from the distal end of the shaft, the shaft configured to extend through the opening;

a washer configured to be disposed on the shaft, and having a plurality of radially slots formed therein extending from the outside edge of the washer toward the inside edge thereof; and

wherein the expander is configured to be movable within which can be drawn through the cavity in a direction generally along the longitudinal axis of the sleeve, from a distal position to a proximal position, whereat the washer contacts the internal cavity to cause the wall of the sleeve to expand transversely to contact the surface of the canal, in which the inner surfaces of the wall converge towards the end of the sleeve towards which the expander is drawn to cause the sleeve to expand to contact the surface of the canal.

2. (Currently Amended) The A-bone cement plug of as claimed in claim 1, wherein in which the sleeve has an end wall at the proximal end thereof towards which the expander is drawn to cause the sleeve to expand.

3. (Currently Amended) The A-bone cement plug of as claimed in claim 2, wherein in which the end wall of the sleeve is formed as a single body with the wall of the sleeve which contacts the surface of the canal when the sleeve is expanded.

4. (Cancelled)

5. (Currently Amended) The A-bone cement plug as claimed in of claim 14, in which wherein the shaft is configured to be frangible at has a defined line of weakness at which it can be broken to allow the transverse portion of the expander to be separated from that portion of the shaft which extends through the opening in the end wall of the sleeve.

6-7. (Cancelled)

8. (Currently Amended) AThe bone cement plug ~~as claimed in~~ of claim 14, ~~in which~~wherein the shaft and transverse portion of the expander are ~~moulded~~ formed as a single component.

9. (Currently Amended) AThe bone cement plug ~~as claimed in~~ of claim 8, ~~in which~~wherein the shaft and the transverse portion of the expander are ~~formed~~ moulded from a resorbable material.

10. (Currently Amended) AThe bone cement plug ~~as claimed in~~ of claim 1, ~~in which~~wherein the angle between the inner surface of the wall and the longitudinal axis of the sleeve, at the distal end of the sleeve ~~from which the expander is drawn through the cavity in a direction to cause the sleeve to expand transversely~~, is at least about 20-degrees.

11. (Currently Amended) AThe bone cement plug ~~as claimed in~~ of claim 1, ~~in which~~wherein the angle between the inner surface of the wall and the longitudinal axis of the sleeve, at the distal end of the sleeve ~~from which the expander is drawn through the cavity in a direction to cause the sleeve to expand transversely~~, is not more than about 50-degrees.

12. (Currently Amended) AThe bone cement plug ~~as claimed in~~ of claim 1, ~~in which~~wherein the outer surface of the sleeve has surface features to promote engagement with the bone surface of the intramedullary canal.

13. (Currently Amended) AThe bone cement plug ~~as claimed in~~ of claim 1, ~~in which~~wherein the sleeve has at least one indent in the surface which defines the internal cavity, the indent extending around the internal cavity approximately in a plane that ~~which~~ is perpendicular to the axis of the sleeve.

14. (Currently Amended) AThe bone cement plug ~~as claimed in~~ of claim 1, ~~in which~~wherein the hardness of the material of the sleeve is at least about 30 Shore A.

15. (Currently Amended) AThe bone cement plug ~~as claimed in~~ of claim 1, ~~in which~~wherein the hardness of the material of the sleeve is not more than about 75 Shore A.

16. (Currently Amended) AThe bone cement plug ~~as claimed in~~ of claim 1, ~~in which~~wherein the sleeve is formed from a resorbable material.

17. (Currently Amended) An assembly for use in orthopaedic surgery, comprising: which comprises a bone cement plug as claimed in claim 1 and an instrument for locating the plug in the intramedullary canal within a bone.

18. (Currently Amended) ~~The An~~ assembly as claimed in claim 17, in which wherein the expander comprises a shaft that which extends generally along the longitudinal sleeve axis, and in which wherein the instrument includes a socket for engaging the shaft on the expander.

19. (Currently Amended) ~~The An~~ assembly as claimed in claim 17, which includes a drive unit by which the expander can be drawn into the sleeve to cause it the expander to move from the distal position to the proximal position to expand transversely.

20. (New) A bone cement plug for fitting into the intramedullary canal within a bone to restrict flow of bone cement during surgery, comprising:

a sleeve having an outer surface configured to contact the wall of the canal, an internal cavity and being formed from a deformable material;

an expander comprising a shaft having a distal end and a transverse portion that extends radially from the distal end of the shaft; and

a washer configured to be disposed on the shaft, and having a plurality of radially slots formed therein extending from the outside edge of the washer toward the inside edge thereof,

wherein the expander is movable within the cavity from a distal position to a proximal position, whereat the washer contacts the internal cavity to cause the wall of the sleeve to expand transversely to contact the surface of the canal.

REMARKS

Claims 1-3, 5, and 8-19 are pending in this application. Claims 4 and 6 are cancelled. The remaining claims are amended to place them into U.S. claiming convention to obviate the claim objections. New claim 20 is added. Applicants submit that no new matter has been added.

Claims 4 and 12 are rejected as being indefinite. Applicants have amended claims 4 and 12 to more clearly define the invention, and submit that claims 4 and 12 are now definite.

Claims 1-4, 8, 13, 17 and 19 stand rejected under 35 USC §102(e) as being anticipated by US Patent No. 5997580 (“Mastrorio”). Applicants respectfully traverse the rejection.

Applicants have amended the claims to add limitations that are not depicted in Mastrorio. For example, Mastrorio does not depict a bone cement plug that includes, among other limitations, a sleeve having a cavity and being formed from a deformable material, an expander comprising a shaft having a distal end and a transverse portion that extends radially from the distal end of the shaft, and a washer configured to be disposed on the shaft, the washer having a plurality of radially slots formed therein extending from the outside edge of the washer toward the inside edge thereof, and wherein the expander is movable within the cavity from a distal position to a proximal position, whereat the washer contacts the internal cavity to cause the wall of the sleeve to expand transversely to contact the surface of the canal.

In particular, Figures 20 and 21 of Mastrorio do not depict an expander configured to be moved from a distal position to a proximal position to cause the expansion of the sleeve. Instead, Mastrorio depicts a balloon that expands radially to cause the sleeve to deform. In addition, Mastrorio also does not depict the washer element of the claim. As a result, Applicants submit that the amended claims define over Mastrorio and seek withdrawal of the rejection.

Claims 6 and 7 stand rejected under 35 USC §103(a) as being unpatentable over Mastrorio in view of US Patent No. 4011602 (“Rybicki”). Claims 6 and 7 have been cancelled, thereby mooting the rejection. Applicants, however, have amended claim 1 to add elements that are similar to what was claimed in claims 6 and 7, and therefore note that Rybicki does not teach or suggest the claimed washer element.

Claims 5, 9-12, 14-16 and 18 stand rejected under 35 USC §103(a) as being unpatentable over Mastrorio in view of various cited prior art. Applicant submits that for at least the reasons described above, these dependent claims are allowable over the cited combinations